

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Hylidae, *Dendropsophus anceps* (Lutz, 1929): filling gap, geographic distribution map and vocalization

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Dendropsophus anceps was described by A. Lutz (1929) as *Hyla anceps* from specimens collected at Estrella, now district of Imbariê, municipality of Duque de Caxias (22°39' S, 43°13' W), Rio de Janeiro state. Bertha Lutz (1973) proposed a complex of species, including *H. leucophyllata*, *H. l. sarayacuensis* (*bifurca*) and *H. ebraccata*, besides the close species *H. zernyi*, *H. mimetica*, *H. luteo-ocellata*, and *H. reticulata*. They were all grouped by their morphology and live coloration as "*species with patagium and vivid flash colors*" (B. Lutz 1973).

Cochran (1955) mentioned the occurrence of specimens of *Dendropsophus anceps* for the locality of Surupuihy (Sarapuy, municipality of Belford Roxo, Rio de Janeiro state – 22°45' S, 45°23' W). Bertha Lutz (1973) recorded this species in the km 47 of the road to São Paulo, municipality of Seropédica, Rio de Janeiro state (22°44' S, 43°43' W).

Until the 1980s, the distribution of *D. anceps* was known only around the type locality. Haddad et al. (1995) expanded its occurrence for the Espírito Santo state, municipality of Barra do Sahy (19°50' S, 40°04' W). Feio et al. (1998) registered *D. anceps* in the Parque Estadual do Rio Doce (PERD, 19°48' – 19°29' S, 42°38' – 42°28' W), located in the southeast region of Minas Gerais state. Nascimento and Feio (1999) enlarged the distribution of this species for another sites of the state of Minas Gerais, with registers in the municipalities of Ipatinga (19°28' S, 42°32' W), Marliéria (19°42' S, 42°36' W), and Aimorés (19°29' S, 41°03' W). According to the authors, all registers of *D. anceps* for the state of Minas Gerais are restricted to the vicinities of the PERD.

Until the 1990s all the records were restricted to Southeast Brazil, except for the state of São Paulo. Argôlo (2000) expanded the occurrence of *D. anceps* for the state of Bahia, municipality of Pau Brasil, Água Santa farm (15°27' S, 39°37' W). With this record, the distribution of the species was expanded for the northeast of Brazil.

Machado and Haddad (2001) registered specimens of *D. anceps* in the state of Paraná, at Monte Alegre farm (24°04'01" S, 50°41'10" W), municipality of Telêmaco Borba, expanding the distribution to South Brazil. The current distribution of the species is restricted to the coast of Brazil, through the Atlantic Forest.

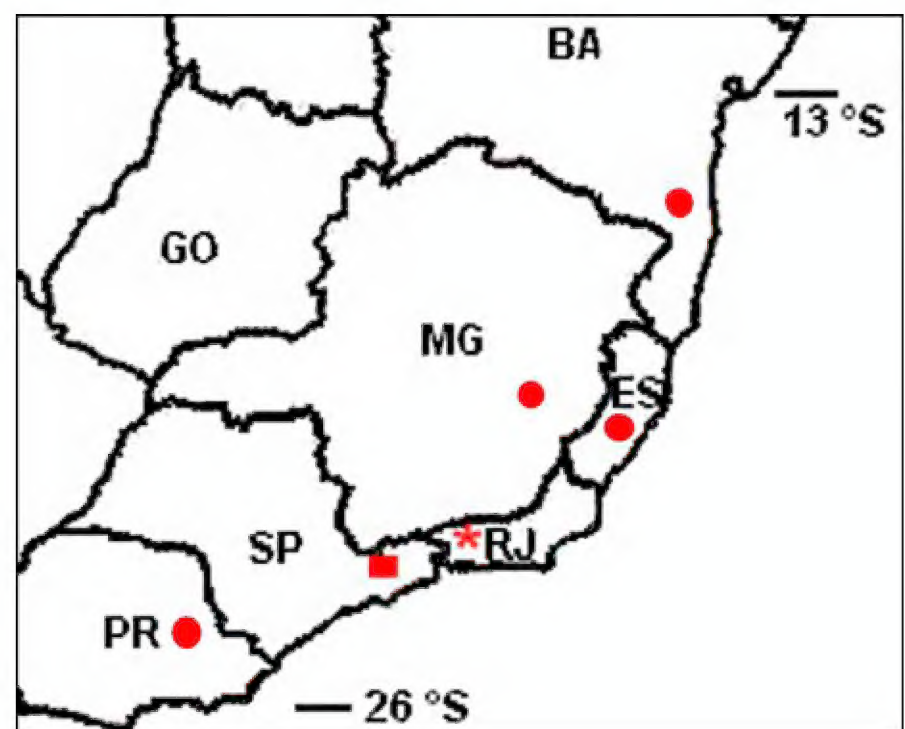


Figure 1. Distribution of *Dendropsophus anceps*; asterisk: type locality; circle: records in other Brazilian states; square: area of the new record.

Recently, *Dendropsophus anceps* was reallocated to the *D. leucophyllatus* group, which is composed by *D. anceps*, *D. bifurcus*, *D. ebraccatus*, *D. elegans*, *D. leucophyllatus*, *D. rossalleni*, *D. sarayacuensis*, and *D. triangulum*, which share 35 transformations in the mitochondrial ribosomal genes (Faivovich et al. 2005).

Herein, we report a new locality for *Dendropsophus anceps*, filling out the gap distribution in the state of São Paulo (Figure 1), and describe the advertisement (*sensu* Wells 1977) and territorial call (*sensu* Littlejohn 2001) for the species in this region.

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The vocalizations were recorded under field conditions with a tape recorder Marantz PMD-222 and an external semidirectional (ME 66) Sennheiser microphone. All recorded vocalizations were edited with a sampling rate of 44.100 Hz and 24 bits per sample in the mono pattern. The bioacoustic analysis was performed using the program CoolEdit 96 (Syntryllium Software Corporation), with a 20.000 Hz sampling frequency. The 256 points option (FFT – Fast Fourier Transform) and, when necessary, the 1024 points option was used, mainly to determine fundamental frequencies.

The identification of the specimens was confirmed by Célio F. B. Haddad. Specimens and calls (License152/05 IBAMA/RAN) were deposited in the Coleção Científica do Laboratório de Zoologia da Universidade de Taubaté – UNITAU (CCLZU/IAM 2142-46) and in the Coleção de Anfíbios do Laboratório de Herpetologia, UNESP, Rio Claro (CBFH 13208-10), both in São Paulo state, Brazil.

Dendropsophus anceps (Figure 2) was recorded in the municipality of Caçapava (23°06'10'' S; 45°43'05'' W – 530 m), São Paulo state. The specimens were recorded during calling activity in a swamp area of approximately 100 x 30 m, with water 1.5 m deep (at February 22nd and March 5th, 2006, by F. B. R. Gomes and R. C. S. Lima). They were observed calling on taboa vegetation (*Typhaceae*, *Typha* sp.), occupying perches at the interior edges and more central to the swamp, forming chorus of about 100 individuals. Bertha Lutz (1973), Argôlo (2000), and Machado and Haddad (2001) mentioned the occurrence of *D. anceps* in the same habitat type and vocalization site as reported here. Eight individuals of *D. anceps* were collected and showed a mean SVL of 35.05 ± 1.9 mm (33.2 - 38.8 mm). The advertisement call of six specimens and the territorial call of four individuals were recorded.

Our specimens of *Dendropsophus anceps* presented two types of vocalizations: the advertisement call (*sensu* Wells 1977) (Figure 3) and the territorial call (*sensu* Littlejohn 2001) (Figure 4). Both were formed by long and multipulsed introductory notes followed by a series of secondary notes of smaller duration (Figures 3 and 4).



Figure 2. Adult male of *Dendropsophus anceps* (Hylidae) from Caçapava, São Paulo state, Brazil. Photo: I. A. Martins.

The number of secondary notes varied from 2 to 10 in the advertisement call and from 4 to 11 in territorial call. The advertisement call, composed by the introductory and secondary notes, presents average duration of 0.95 s (0.44 – 1.4 s). The territorial call presents average duration of 1.3 s. (0.78 – 1.87 s). The characteristics of the secondary notes were the same for the two call types. The introductory and secondary notes showed two frequency bands and formed two harmonics (H1 and H2).

The introductory note of the territorial call exhibited a light ascendant modulation of frequency and in some cases showed up to four harmonics, with the H3 and H4 showing smaller intensities (Figure 4B). The difference between the two call types consisted of the temporal and spectral structure of the introductory notes. The introductory note of the advertisement call presents average duration of 120 ms, each note having 10 to 18 pulses, with frequency band ranging from 1552 to 3937 Hz, dominant frequency around 3244 Hz. The introductory note of the territorial call presents average duration of 240.8 ms, formed by long and multipulsed note, with frequency band ranging from 1406 to 3559 Hz, dominant frequency around 3163 Hz. The spectral and temporal characteristics of the introductory and secondary notes of the advertisement and territorial calls are presented in table 1.

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Bokermann (1967) described the call of *D. anceps* recorded in the municipality of Itaguaí, Rio de Janeiro state (now municipality of Seropédica). However, the sonogram presented in his work referred to the territorial call of the species, easily identified by the introductory note. The call reported by Bokermann (1967) presented an

introductory note with duration of ca. 400 ms and dominant frequency of 1500 Hz in the introductory and secondary notes. The duration and dominant frequency of the introductory and secondary notes of the territorial call presented by Bokermann (1967) differ from those described in this paper (table1).

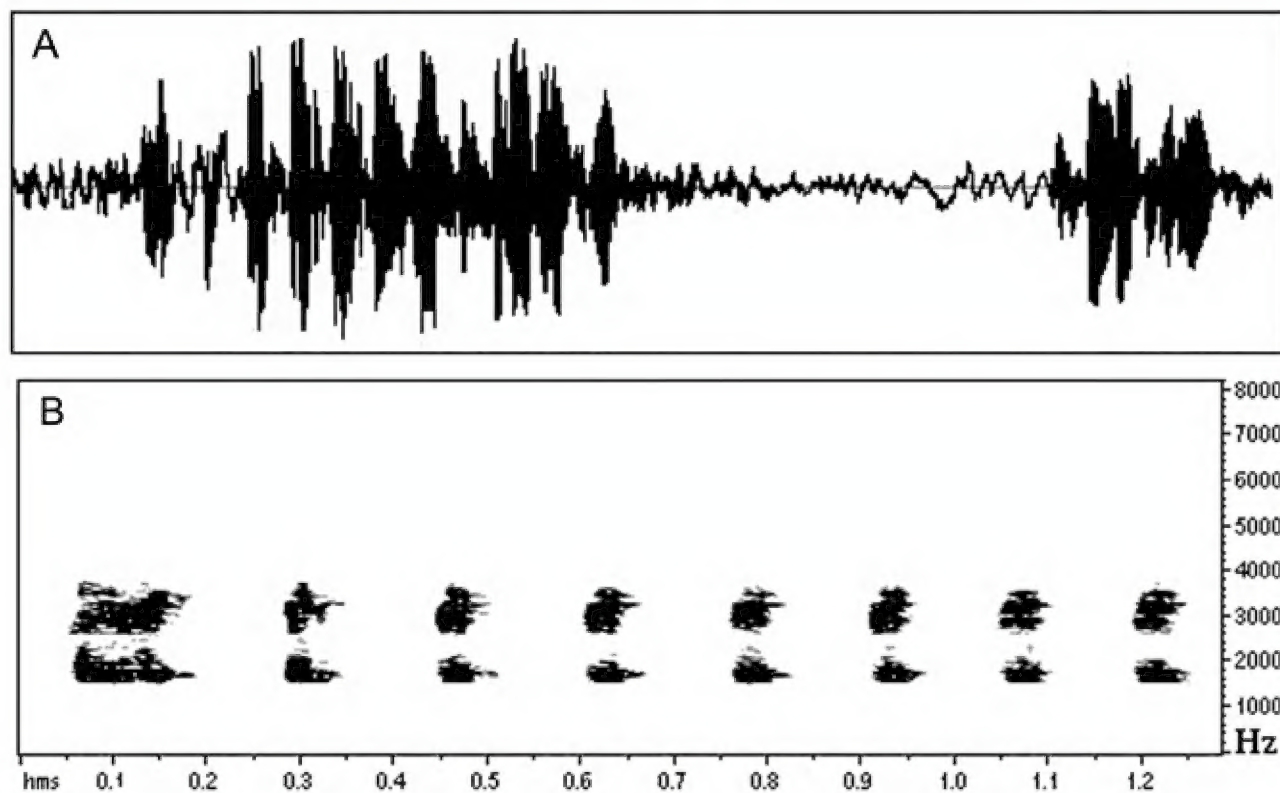


Figure 3. (A) Oscillogram (first two notes) and (B) sonogram of the advertisement call of *Dendropsophus anceps*, showing the introductory and secondary notes. Air temperature 22° C, March 5th, 2006. Caçapava, São Paulo state, Brazil.

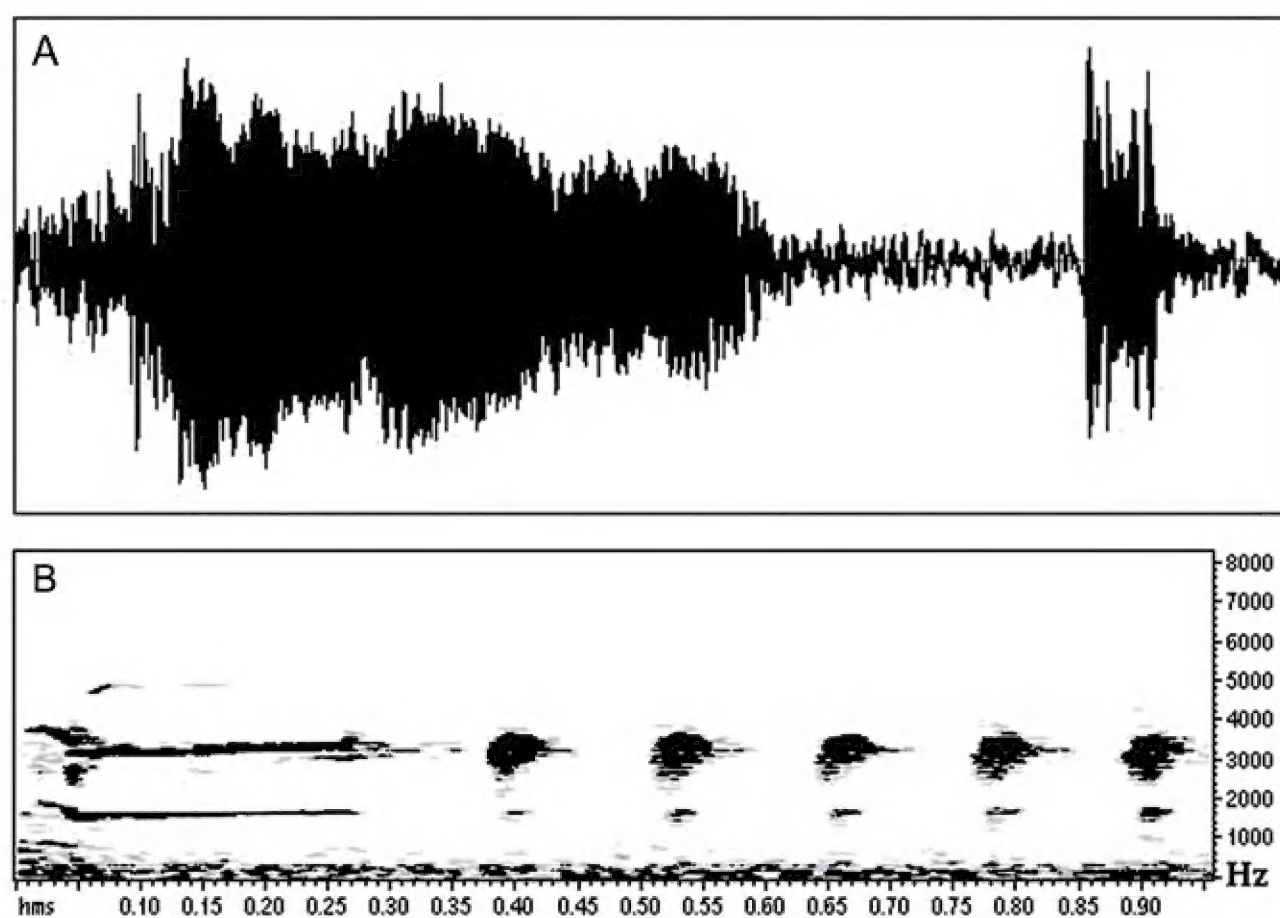


Figure 4. (A) Oscillogram (first two notes) and (B) sonogram of the territorial call of *Dendropsophus anceps*, showing the introductory and secondary notes. Air temperature 22° C, March 5th, 2006. Caçapava, São Paulo state, Brazil.

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Table 1. Bioacoustic parameters measured for the introductory and secondary notes of the advertisement and territorial calls of *Dendropsophus anceps* from Caçapava, São Paulo state. Mean $\pm$ standard deviation (range).

	Advertisement call (introductory note) (n=46)	Territorial call (introductory note) (n=23)	Secondary note (n=93)
Frequency bands (Hz)	1552 – 3937 $\pm$ 145 (1360 - 4175)	1406 – 3559 $\pm$ 112 (1170 – 3774)	1466 – 3934 $\pm$ 117 (1313 – 4269)
Dominant frequency (Hz)	3244 $\pm$ 114 (2997 – 3435)	3163 $\pm$ 124 (2955 – 3323)	3275 $\pm$ 72 (3116 – 3422)
Harmonic (H1)	1552 – 2177 $\pm$ 135 (1360 – 2486)	1406 – 1669 $\pm$ 118 (1170 – 1820)	1466 – 1933 $\pm$ 122 (1313 – 2251)
Harmonic (H2)	2699 – 3937 $\pm$ 121 (2486 – 4175)	2791 – 3559 $\pm$ 112 (2462 – 3774)	2646 – 3934 $\pm$ 117 (2439 – 4269)
Note duration (ms)	120 $\pm$ 22.5 (93 – 183)	240.8 $\pm$ 28.7 (168 – 290)	43 $\pm$ 5.3 (35 – 57)
Number pulse per note	12 $\pm$ 2 (10 – 18)	<i>multipulsed</i>	6 $\pm$ 1.2 (4 – 8)

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